

**WHAT IS CLAIMED IS:**

5 *Sub* 1. A system comprising a plurality of computing systems, the system comprising:

a cage having a plurality of slots, wherein each of the slots is adapted to receive a computer card;

a plurality of computer cards, wherein each computer card comprises one of the plurality of computing systems;

10 a removable function module, wherein the removable function module is operable to electrically couple to at least a subset of the plurality of computer cards, wherein the removable function module is operable to provide additional functionality to each of the computer cards comprised in the slots of the cage.

15 2. The system of claim 1, wherein each of the plurality of computer cards is adapted for coupling to one or more cables for communication of encoded human interface signals with a remote location.

20 3. The system of claim 2, wherein each of the plurality of computer cards is further adapted for communication of network signals with a network.

25 4. The system of claim 1, wherein the cage further includes a cage connector positioned proximate to each of the slots of the cage, wherein the cage connector includes a plurality of computer card connectors which are each adapted to couple to one of the computer cards when the computer cards are inserted into slots of the cage, wherein the cage connector further includes a plurality of second connectors electrically coupled to the plurality of computer card connectors;

wherein the removable function module is operable to be coupled to the plurality of second connectors.

5. The system of claim 4, wherein the plurality of second connectors are each adapted for coupling to one or more cables for communication of encoded human interface signals with a remote location, and for communication of network signals with a network;

5 6. The system of claim 1, wherein the removable function module is a first removable function module that provides first functionality;

wherein the first removable function module is operable to be removed and replaced with a second different removable function module, wherein the second  
10 removable function module provides second different functionality to each of the computer cards comprised in the slots of the cage.

7. The system of claim 1,  
wherein the removable function module comprises one or more of:

15 at least one cable connection module, wherein the at least one cable connection module is operable to provide cable connections to one or more cables for the plurality of computer cards;

20 at least one network card, wherein the at least one network card is operable to provide a network interface to the plurality of computer cards; and

at least one network switch, wherein the at least one network switch is operable to perform network switching functions for the plurality of computer cards;

25 at least one data switch, wherein the at least one data switch is operable to perform data switching functions for the plurality of computer cards;

at least one network router, wherein the at least one network router is operable to perform network routing functions for the plurality of computer cards;

5 at least one network processing unit, wherein the at least one network processing unit is operable to perform network processing functions for the plurality of computer cards;

10 a Gigabit Ethernet network interface, wherein the Gigabit Ethernet network interface includes a Gigabit Ethernet bus, wherein the Gigabit Ethernet network interface comprises a plurality of Gigabit Ethernet ports for each of at least a subset of the plurality of computer cards;

15 at least one gateway, wherein the at least one gateway is operable to perform gateway functions for the plurality of computer cards;

at least one firewall, wherein the at least one firewall is operable to restrict network access to the plurality of computer cards;

20 a human interface switching unit, wherein the human interface switching unit is configurable to route encoded human interface signals from one or more of the plurality of computer cards to one or more of a plurality of remote human interface devices coupled to the removable function module;

25 at least one analog POTS unit, wherein the at least one analog POTS unit is operable to provide standard analog telephony services to the plurality of computer cards;

at least one digital telephone, wherein the at least one digital telephone is operable to provide digital telephony services to the plurality of computer cards;

at least one PBX unit, wherein the at least one PBX unit is operable to provide PBX services to the plurality of computer cards;

5           at least one Voice over Internet Protocol (VoIP) telecommunication device, wherein the at least one VoIP telecommunication device is operable to provide VoIP services to the plurality of computer cards;

10           at least one MPEG video unit, wherein the at least one MPEG video unit is operable to provide MPEG video services to the plurality of computer cards.

8.       The system of claim 1, wherein the external connectors are standard connectors, and wherein the standard connectors comprise one or more of RJ45, db9, db25, or dbhd15 connectors.

15       9.       The system of claim 1, wherein the plurality of computing systems comprises a plurality of independent computing systems.

20       10.      The system of claim 1,  
          wherein each computer card comprises:  
            a frame;  
            a printed circuit board mounted to the frame;  
            a CPU comprised on the printed circuit board;  
            a memory comprised on the printed circuit board;  
25           a non-volatile memory comprised on the frame;  
            network interface logic comprised on the printed circuit board for interfacing to a network;

human interface logic comprised on the printed circuit board which is operable to receive two or more human interface signals and encode the two or more human interface signals into a format suitable for transmission to a remote location;

5 wherein the human interface logic is further operable to receive two or more encoded human interface signals from the remote location and decode the two or more encoded human interface signals from a format suitable for transmission from the remote location;

a human interface connector coupled to the human interface logic, wherein the human interface connector is adapted to couple to the one or more cables for  
10 communication of the encoded human interface signals with a remote location; and

a power supply comprised on the frame, wherein the power supply is operable to couple to an external power source and supply power to the plurality of computing systems.

15 11. A system comprising a plurality of computing systems, the system comprising:

a cage having a plurality of slots, wherein each of the slots is adapted to receive a computer card;

a plurality of computer cards, wherein each computer card comprises one of the  
20 plurality of computing systems;

wherein the cage further includes a cage connector positioned proximate to each of the slots of the cage, wherein the cage connector includes a plurality of computer card connectors which are each adapted to couple to one of the computer cards when the computer cards are inserted into slots of the cage, wherein the cage connector further  
25 includes a plurality of second connectors electrically coupled to the plurality of computer card connectors; and

a removable function module, wherein the removable function module is operable to couple to the plurality of second connectors, wherein the removable function module is

operable to provide additional functionality to each of the computer cards comprised in the slots of the cage.

12. The system of claim 11, wherein each of the plurality of computer cards is adapted for coupling to one or more cables for communication of encoded human interface signals with a remote location, and for communication of network signals with a network.

13. The system of claim 12, wherein each of the plurality of computer cards is adapted for coupling to the one or more cables through the plurality of second connectors.

14. The system of claim 12, wherein each of the plurality of computer cards is adapted for coupling to the one or more cables through the plurality of second connectors and through the removable function module.

15. The system of claim 11, wherein the removable function module is a first removable function module that provides first functionality;

wherein the first removable function module is operable to be removed and replaced with a second different removable function module, wherein the second removable function module provides second different functionality to each of the computer cards comprised in the slots of the cage.

16. The system of claim 11, wherein the removable function module comprises one or more of:

at least one cable connection module, wherein the at least one cable connection module is operable to provide cable connections to one or more cables for the plurality of computer cards;

at least one network card, wherein the at least one network card is operable to provide a network interface to the plurality of computer cards; and

at least one network switch, wherein the at least one network switch is operable to perform network switching functions for the plurality of computer cards;

at least one data switch, wherein the at least one data switch is operable to perform data switching functions for the plurality of computer cards;

at least one network router, wherein the at least one network router is operable to perform network routing functions for the plurality of computer cards;

at least one network processing unit, wherein the at least one network processing unit is operable to perform network processing functions for the plurality of computer cards;

a Gigabit Ethernet network interface, wherein the Gigabit Ethernet network interface includes a Gigabit Ethernet bus, wherein the Gigabit Ethernet network interface comprises a plurality of Gigabit Ethernet ports for each of at least a subset of the plurality of computer cards;

at least one gateway, wherein the at least one gateway is operable to perform gateway functions for the plurality of computer cards;

at least one firewall, wherein the at least one firewall is operable to restrict network access to the plurality of computer cards;

a human interface switching unit, wherein the human interface switching unit is configurable to route encoded human interface signals from one or more of the

plurality of computer cards to one or more of a plurality of remote human interface devices coupled to the removable function module;

5 at least one analog POTS unit, wherein the at least one analog POTS unit is operable to provide standard analog telephony services to the plurality of computer cards;

10 at least one digital telephone, wherein the at least one digital telephone is operable to provide digital telephony services to the plurality of computer cards;

at least one PBX units, wherein the at least one PBX unit is operable to provide PBX services to the plurality of computer cards;

15 at least one Voice over Internet Protocol (VoIP) telecommunication device, wherein the at least one VoIP telecommunication device is operable to provide VoIP services to the plurality of computer cards;

20 at least one MPEG video unit, wherein the at least one MPEG video unit is operable to provide MPEG video services to the plurality of computer cards.

17. The system of claim 11, wherein the external connectors are standard connectors, wherein the standard connectors comprise one or more of RJ45, db9, db25, or dbhd15 connectors.

25 18. The system of claim 11, wherein the plurality of computing systems comprises a plurality of independent computing systems.

19. The system of claim 11,  
wherein each computer card comprises:



a frame;  
a printed circuit board mounted to the frame;  
a CPU comprised on the printed circuit board;  
a memory comprised on the printed circuit board;  
5 a non-volatile memory comprised on the frame;  
network interface logic comprised on the printed circuit board for  
interfacing to a network;  
human interface logic comprised on the printed circuit board which is  
operable to receive two or more human interface signals and encode the two or more  
10 human interface signals into a format suitable for transmission to a remote location; and  
a human interface connector coupled to the human interface logic, wherein  
the human interface connector is adapted to couple to the one or more cables for  
transmission of the encoded human interface signals to a remote location; and  
a power supply comprised on the frame, wherein the power supply is  
15 operable to couple to an external power source and supply power to the plurality of  
computing systems.

20. The system of claim 11, further comprising a cable connection module,  
wherein the cable connection module comprises a plurality of third connections which are  
20 operable to electrically connect to the plurality of second connectors, and wherein the  
cable connection module is further operable to couple to one or more cables for one or  
more of communications between each computer card and respective remote locations,  
and communications between each computer card and a network.

25 21. A method for configuring a plurality of computing systems, the method  
comprising:

inserting a plurality of computer cards into a cage, wherein each computer card  
comprises one of the plurality of computing systems, wherein the cage comprises a

plurality of slots, wherein each of the slots is adapted to receive one of the computer cards; and

attaching a first removable function module to electrically connect with at least a subset of the plurality of computer cards, wherein the first removable function module provides a first additional functionality to each of the at least a subset of the plurality of computer cards comprised in the slots of the cage.

22. The method of claim 21, further comprising:  
removing the first removable function module; and  
attaching a second removable function module to electrically connect with at least a subset of the plurality of computer cards, wherein the second removable function module provides a second additional functionality to each of the at least a subset of the plurality of computer cards comprised in the slots of the cage.

23. The method of claim 21, further comprising:  
electrically coupling each of the computer cards to one or more cables, wherein the one or more cables are adapted to couple each of the computer cards to respective one or more human interface devices located remotely from the cage.

24. The method of claim 23,  
wherein said electrically coupling comprises attaching the one or more cables to the first removable function module, wherein the one or more cables couple the first removable function module to the one or more human interface devices.

25. The method of claim 23,  
wherein the one or more human interface devices are located more than 20 feet from the cage.

26. The method of claim 21, further comprising:

electrically coupling each of the computer cards to one or more cables, wherein the one or more cables are adapted to couple each of the computer cards to a network.

27. The method of claim 26,  
5 wherein said electrically coupling comprises attaching the one or more cables to the first removable function module, wherein the one or more cables couple the first removable function module to the network.

28. The method of claim 21, further comprising:  
10 electrically coupling each of the computer cards to one or more cables, wherein the one or more cables are adapted to couple the plurality of computer cards to one or more telephone lines.

29. The method of claim 28,  
15 wherein said electrically coupling comprises attaching the one or more cables to the first removable function module, wherein the one or more cables couple the first removable function module to the one or more telephone lines.

30. The method of claim 21,  
20 wherein each computer card comprises:  
a frame;  
a printed circuit board mounted to the frame;  
a CPU comprised on the printed circuit board;  
a memory comprised on the printed circuit board;  
25 a non-volatile memory comprised on the frame;  
network interface logic comprised on the printed circuit board for interfacing to a network;

human interface logic comprised on the printed circuit board which is operable to receive two or more human interface signals and encode the two or more human interface signals into a format suitable for transmission to a remote location; and

a human interface connector coupled to the human interface logic, wherein  
5 the human interface connector is adapted to couple to one or more cables for transmission of the encoded human interface signals to the remote location;

wherein the human interface logic is further operable to receive two or more encoded human interface signals from the remote location and decode the two or more encoded human interface signals from a format suitable for transmission from the  
10 remote location; and

wherein the human interface connector is further adapted to couple to the one or more cables for reception of the encoded human interface signals from the remote location.

15 31. A method for configuring a plurality of computing systems, the method comprising:

inserting a plurality of computer cards into a cage, wherein each computer card comprises one of the plurality of computing systems, wherein the cage comprises a plurality of slots, wherein each of the slots is adapted to receive one of the computer  
20 cards, wherein the cage further includes a cage connector positioned proximate to each of the slots of the cage, wherein the cage connector includes a plurality of computer card connectors which are each coupled to one of the computer cards when the computer cards are inserted into the slots of the cage, wherein the cage connector further includes a plurality of second connectors electrically coupled to the plurality of computer card  
25 connectors;

attaching a first removable function module to the plurality of second connectors, wherein the first removable function module provides a first additional functionality to each of the computer cards comprised in the slots of the cage; and

attaching one or more cables to the first removable function module, wherein the one or more cables couple the first removable function module to one or more of a plurality of human interface devices located remotely from the cage.

5           32.    The method of claim 31, further comprising:  
              detaching the one or more cables from the first removable function module;  
              detaching the first removable function module from the plurality of second  
connectors;

              attaching a second removable function module to the plurality of second  
10   connectors, wherein the second removable function module provides a second additional  
functionality to each of the computer cards comprised in the slots of the cage; and

              attaching the one or more cables to the second removable function module,  
wherein the one or more cables couple the second removable function module to the one  
or more of the plurality of human interface devices located remotely from the cage.

15           33.    The method of claim 31,  
              wherein the one or more cables also couple the first removable function module to  
one or more networks for communication between the plurality of computer cards and the  
one or more networks;

20           34.    The method of claim 31,  
              wherein the one or more cables also couple the first removable function module to  
one or more telephone lines for communication of telephony signals between the plurality  
of computer cards and the one or more telephone lines.

25           35.    The method of claim 31,  
              wherein the plurality of computing systems comprises a plurality of independent  
computing systems.

36. The method of claim 31,  
wherein each computer card comprises:

5 a frame;  
a printed circuit board mounted to the frame;  
a CPU comprised on the printed circuit board;  
a memory comprised on the printed circuit board;  
a non-volatile memory comprised on the frame;  
network interface logic comprised on the printed circuit board for  
interfacing to a network;

10 human interface logic comprised on the printed circuit board which is  
operable to receive two or more human interface signals and encode the two or more  
human interface signals into a format suitable for transmission to at least one of the  
plurality of human interface devices; and

15 a human interface connector coupled to the human interface logic, wherein  
the human interface connector is adapted to couple to the one or more cables for  
transmission of the encoded human interface signals to the at least one of the plurality of  
human interface devices;

20 wherein the human interface logic is further operable to receive two or  
more encoded human interface signals from the at least one of the plurality of human  
interface devices and decode the two or more encoded human interface signals from a  
format suitable for transmission from the at least one of the plurality of human interface  
devices; and

25 wherein the human interface connector is further adapted to couple to the  
one or more cables for reception of the encoded human interface signals from the at least  
one of the plurality of human interface devices.

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